Chapter 6
Plan Implementation

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Acronyms and Abbreviations

BA	biological assessment
BDCP	Bay Delta Conservation Plan
BO	biological opinion
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CM	Conservation Measure
CVP	Central Valley Project
CWA	Clean Water Act
DBEEP	Delta-Bay Enhanced Enforcement Program
DFG	California Department of Fish and Game
DHCCP	Delta Habitat Conservation and Conveyance Program
DWR	California Department of Water Resources
ESA	federal Endangered Species Act
FR	Federal Register
HCP	habitat conservation plan
IEP	Interagency Ecological Program
NCCPA	Natural Community Conservation Planning Act
NCCP	Natural Community Conservation Plan
NMFS	National Marine Fisheries Service
Reclamation	Bureau of Reclamation
SMSCG	Suisun Marsh Salinity Control Gates
SWP	State Water Project
UC Davis	University of California at Davis
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service

6.1

Chapter 7
Plan Implementation

*[**Note to Reviewers:** This is a revised version of BDCP Chapter 6,* Implementation Plan*. The last draft of Chapter 6 was presented on November 18, 2010. Chapter 6 is intended to describe the actions and timeline associated with plan implementation, and to discuss certain issues that may arise in the course of plan implementation, such as changed or unforeseen circumstances, plan modification or amendment, permit duration, and permit suspension or revocation. The discussion of actions and timeline must be taken in the context of Chapter 3,* Conservation Strategy*, which is still under revision. Please consult the November 2010 BDCP draft for the latest distributed version of that chapter, and also for other chapters referred to within Chapter 6. At this writing, updated versions of Chapter 2 and Chapter 10 are also available and have previously been distributed for regulatory agency review.]*

To effectively achieve the overall goals of ecosystem restoration and water supply reliability, the Bay Delta Conservation Plan (BDCP) sets out a conservation strategy that will be implemented over the long term. This chapter identifies the key issues that are related to plan implementation and describes the approaches that will be used to address those issues. This chapter, for instance, establishes a schedule for the implementation of the BDCP conservation measures, which will guide the timing and sequencing of measures to enhance opportunities to advance the biological goals and objectives. It further describes requirements for planning, annual workplans and budgets, monitoring, compliance reporting, and scientific review to ensure transparency in decision-making and to promote refinements to approaches to BDCP implementation.

The chapter further describes the regulatory assurances under the federal Endangered Species Act (ESA) and the Natural Community Conservation Planning Act (NCCPA) that are expected to be provided to the Proposed Authorized Entities. It also describes the commitment of the Implementation Office and the Proposed Authorized Entities to respond to foreseeable changes in circumstances that may adversely affect covered species and habitats, and identifies a process by which changes that are not foreseeable can be addressed. The chapter identifies the circumstances under which regulatory authorizations may be suspended or revoked. This chapter, in combination with Chapter 3, *Conservation Strategy*, Chapter 7, *Implementation Structure*, and Chapter 8, *Implementation Costs and Funding Sources*, provides the full description of actions, commitments, and approaches to ensure effective implementation of the BDCP.

7.1 Plan Implementation Schedule

The implementation of the BDCP conservation measures will be guided by a schedule that has been developed to maximize the effectiveness of the conservation strategy (Figure 6-1). The BDCP implementation schedule establishes an approximate timeframe and sequence for the initiation of the actions associated with each of the conservation measures. The cumulative habitat outcomes of implementing BDCP conservation measures under this implementation schedule are depicted in Figure 6-2. Implementation of these actions will begin in year 0, the year in which regulatory authorizations are issued by the state and federal fish and wildlife agencies pursuant to the BDCP. The implementation schedule will inform the Implementation Office as it establishes priorities and develops annual workplans and budgets. This implementation schedule has served as the basis for estimating funding needs over the term of BDCP implementation (Chapter 8, *Implementation Costs*

and Funding Sources). It also has been used in the effects analysis to assess the anticipated timing of biological effects on and benefits to covered species and natural communities associated with the implementation of the BDCP (Chapter 5, *Effects Analysis*).

The implementation schedule represents a reasonable estimate of the temporal sequence for implementation of the various interdependent conservation actions over the term of the BDCP based on the best available information. The BDCP is a large and complex plan and, to ensure successful implementation, the Implementation Office will need to retain a degree of flexibility to address new information that is developed over the term of BDCP that may require adjustments in the implementation schedule to better ensure that the biological goals and objectives are achieved. Consequently, the actual timing of implementation of some conservation actions may vary from the implementation schedule described below. Substantial variances in the implementation schedule may need to be addressed through the adaptive management process described in Section 3.5, *Adaptive Management and Monitoring Program*.

The BDCP implementation schedule was informed by information, data, and analysis used to develop the conservation strategy, including:

- The near-term, early long-term, and late long-term restoration targets established for tidal, seasonally inundated floodplain, and channel margin habitats (Section 3.4, *Conservation Measures*) and the extent of habitat restoration effects on natural communities and covered species habitats (Chapter 5, *Effects Analysis*).
- Vernal pool complex and grassland restoration targets (Section 3.4, *Conservation Measures*) and the extent of habitat restoration effects on natural communities and covered species habitats (Chapter 5, *Effects Analysis*).
- Vernal pool complex, alkali seasonal wetland complex, grassland, and agricultural habitat protection/preservation targets (Section 3.4, *Conservation Measures*).
- The pipeline/tunnel construction schedule and the extent of construction effects on natural communities and covered species habitats (Chapter 5, *Effects Analysis*).

The estimated timeframes for implementation of each conservation measure were determined based on evaluations of similar types of actions that have been completed and on input from individuals experienced with similar types of projects.

7.1.1 Ecosystem-Level Conservation Measures

Ecosystem-level conservation measures are actions that affect large areas of the Delta and large-scale ecosystem processes, including flow, hydrodynamics, water quality, and large areas of terrestrial, floodplain, and aquatic habitat.

7.1.1.1 Conservation Measure 1 Water Facilities and Operation

7.1.1.1.1 Suisun Marsh Salinity Control Gates

Changes in operation of the Suisun Marsh Salinity Control Gates (SMSCG) require changes to existing agreements that are assumed to become effective in the early long-term implementation period.

7.1.1.1.2 Construction of North Delta Diversion and Conveyance Facilities

The implementation schedule is based on an assumption that construction of the new north Delta diversion and conveyance facilities and related actions will require up to 10 years to complete (Figure 6-1). Scheduled activities that would be implemented during this period include acquisition of lands, preparation and submittal of regulatory permit applications, preparation and letting of construction-related contracts, and facilities construction. This construction time assumption is based on rough estimates provided by Delta Habitat Conservation and Conveyance Program (DHCCP) engineers.

Water Operations

Implementation of the water operations conservation measure is dependent on completion of construction of the north Delta diversion and conveyance facilities, assumed to be 10 years. Water operations then would continue over the remaining 50-year term of the BDCP. The schedule is based on the assumption that construction of the north Delta diversion and conveyance facilities will be completed in year 10 and that long-term water operations will commence in year 11 (Figure 6-1). Long-term water operations include an initial testing phase in which intake structures and facilities are tested and effects monitoring would occur.

7.1.1.2 Conservation Measure 2 Yolo Bypass Fisheries Enhancements

Because of the diverse group of project stakeholders and the complex issues (e.g., agriculture, waterfowl and wildlife management, flood protection, recreation, tax revenue, contaminants, vector control) that need to be considered during the development and implementation of enhancement actions in the Yolo Bypass, it is assumed that the Yolo Bypass fisheries enhancements will be implemented through a phased multi-year program. A schedule for this program is presented in the description of Conservation Measure (CM) 2 (Section 3.4.2.2), and the program will be fully detailed in the Yolo Bypass Fisheries Enhancement Program. It is estimated that project planning, environmental compliance documentation, permitting, engineering design, and acquisition of flood easements and land (if necessary) will be completed by year 10. Modifications to the Fremont Weir, Lisbon Weir, and the lower Putah Creek channel, and any other modifications to the configuration of the Yolo Bypass to direct and contain bypass flows resulting from operation of the modified Fremont Weir, and/or to improve fish passage, will be initiated in year 11 and that the modified passage structures will be operational in year 13 (Figure 6-1). Following project construction, operations would be monitored and managed adaptively to provide passage and other biological benefits for fish species while maintaining and/or enhancing other beneficial uses of the bypass.

7.1.1.3 Conservation Measure 3 Natural Communities Protection

The implementation schedule for actions to preserve natural communities assumes that acquisition, protection/preservation, enhancement, and management of existing vernal pool complex, alkali seasonal wetland complex, grassland habitat, and agricultural habitats will be initiated prior to BDCP authorization. Implementation would occur approximately concurrent with or in advance of the adverse effects of BDCP implementation on these natural communities and the covered species habitats they support. The schedule assumes that, except for protection actions implemented in the second year following BDCP authorization, a 2-year period will be necessary to identify and bring under protection (e.g., through conservation easement, fee title acquisition, other means) existing natural communities. Based on the expected timing of adverse impacts on natural communities and

covered species habitat resulting from construction activities early in BDCP implementation, the schedule is based on the assumption that planning for the first increment of protection of existing alkali seasonal wetland complex, grassland, and agricultural habitat will be initiated prior to BDCP authorization.

In addition to the protection of existing natural communities and covered species habitat, natural communities and covered species habitat that will be restored under CM 4 through CM 10 will be included in the BDCP preserve system. The implementation schedule for habitat restoration actions is described in Section 6.1.2, *Natural Community-Level Conservation Measures*.

The schedule for protection of natural communities and covered species habitat includes time for activities by the Implementation Office to identify specific parcels of land available for acquisition that have physical and biological characteristics that make them suitable for achieving habitat protection targets.

Figures 6-3 through 6-6 show the timing of effects of BDCP actions on existing vernal pool complex, alkali seasonal wetland complex, grassland, and agricultural habitats in relation to when these habitat protection and preservation actions are implemented. The implementation schedule assumes that monitoring and management of protected and preserved habitats will occur over the remainder of the term of the BDCP following completion of each restoration increment as described in CM 11 Natural Communities Enhancement and Management.

7.1.2 Natural Community Conservation Measures

Natural community conservation measures address actions to restore tidal, riparian, seasonally inundated floodplain, vernal pool complex, and grassland habitat; enhance channel margin habitat; and enhance and manage BDCP preserve lands. The schedule for implementing each habitat restoration action comprises the following elements.

- Habitat enhancement and restoration site acquisition.
- Enhancement and restoration planning and design.
- Regulatory compliance.
- Habitat restoration and enhancement implementation activities.

These elements generally are expected to be implemented concurrently and are aggregated in the implementation schedule (Figure 6-1).

Habitat enhancement and restoration site acquisition. These actions include the identification and acquisition of specific parcels of available land that have physical and biological characteristics suitable to advance habitat protection, enhancement, and restoration objectives. Site acquisitions for actions that involve modifications to levees (e.g., setting back levees to restore seasonally inundated floodplain habitat) include obtaining concurrence of the responsible agencies to initiate planning studies.

Enhancement and restoration planning and design. This implementation element includes all activities related to:

- Development of conceptual habitat enhancement and restoration designs, including coordinating development of conceptual restoration designs with stakeholders (e.g., local, state, and federal agencies, potentially affected landowners).

- Development of detailed habitat enhancement and restoration designs and cost estimates.
- Development of bid specifications and drawings.
- Preparation of habitat enhancement and restoration contracts and contractor selection.

Regulatory compliance. This implementation element includes the preparation and submittal of documents and applications associated with compliance with and acquisition of the permits associated with applicable laws and regulations, including:

- Additional project-level review under CEQA and NEPA.
- Sections 401 and 404 of the federal Clean Water Act (CWA), including Nationwide Permit 27, Stream and Wetland Activities.
- California Water Code Sections 1000 *et seq*. (water rights).
- Water Code Sections 13000 *et seq*. (water quality).
- Sections 10 (33 USC 403) and 14 (33 USC 408) of the Rivers & Harbors Act of 1899.
- Section 1602 of the California Fish and Game Code (Streambed and Lakebed Alteration Agreements).
- Section 106 of the National Historic Preservation Act.
- Encroachment permits for work on levees from the Central Valley Flood Protection Board and reclamation districts.

Habitat restoration and enhancement implementation activities. This implementation element includes all activities related to completing habitat restoration actions including:

- Contractor mobilization.
- Site preparation, including grading, excavation, and placement of fill.
- Construction/installation of water management, utility, and other operational infrastructure.
- Demolition or refurbishment of existing infrastructure.
- Construction of dikes, levees, and roads.
- Planting vegetation.

7.1.2.1 Conservation Measure 4 Tidal Habitat Restoration

The implementation schedule for tidal habitat restoration actions is based on the assumption that site acquisition, planning, and any required environmental or regulatory compliance activities for the first 4,000 acres of tidal habitat restoration are initiated prior to BDCP authorization. The first 500 acres of these initial restoration actions, therefore, could be constructed immediately following BDCP authorization. Restoration of the remaining 3,500 acres would occur in years 3 through 5 (Figure 6-1). These initial restoration actions are expected to require less time to acquire and permit than restoration actions for other natural communities because tidal habitat restoration is assumed to be implemented on sites that will be readily available to the Implementation Office (e.g., state- and federally owned lands). The schedules for implementation of subsequent tidal habitat restoration actions are based on the assumption that 5 years are required to acquire restoration lands, conduct analyses, develop conceptual plans, obtain any outstanding environmental and

regulatory approvals and permits, develop bid specifications and drawings, construct new levees (if required) and habitat features, and breach existing levees (Figure 6-1). It is anticipated that most or all of tidal habitat restored during the near-term implementation period will be restored in the Cache Slough Complex, Suisun Marsh, and West Delta areas.

Figure 6-7 shows the timing of adverse effects of construction activities on existing tidal habitats in relation to when tidal habitat restoration actions are implemented. The implementation schedule assumes that monitoring and management of restored tidal habitats will occur over the remainder of the term of the BDCP following completion of each restoration increment as described in CM 11 Natural Communities Enhancement and Management.

The tidal habitat restoration conservation measure provides for the restoration of varying amounts of subtidal aquatic, tidal mudflat, and tidal marsh habitat over time, depending on location and restoration design in the Plan Area. Figure 6-8 presents reasonable representations of how restored tidal habitat may develop over time within 1,000-acre conceptual restoration sites at Suisun Marsh, the Cache Slough Complex, and the south Delta. Development of fully functioning habitat may take years following the restoration of tidal exchange based on initial site elevations, suspended sediment concentrations, aggradation and organic material accumulation rates, and sea level changes. The habitat functions supported for covered species also will change over time as marsh vegetation composition, structure, and density and tidal channels evolve over time.

7.1.2.2 Conservation Measure 5 Seasonally Inundated Floodplain Restoration

Restoration of seasonally inundated floodplain habitat will require extensive levee setbacks to reconnect historical floodplain with Delta channels. The implementation schedule assumes that at least 1,000 acres of floodplain will be restored by year 15 and that restoration of the remaining 9,000 acres of floodplain restoration will be completed in increments of 3,000 acres by years 25, 30, and 40, respectively. Each floodplain restoration increment will, on average, require 5 years to identify potential floodplain restoration sites; coordinate planning with the U.S. Army Corps of Engineers (USACE), California Department of Water Resources (DWR) and other flood control agencies and reclamation districts; and conduct feasibility studies prior to implementation. Following approval of floodplain restoration plans, an additional 5 years are assumed to be required to acquire restoration lands, obtain any outstanding regulatory approvals and permits, develop bid specifications and drawings, construct the new levees and floodplain, and breach existing levees.

The implementation schedule assumes that monitoring and management of restored seasonally inundated floodplains will occur over the remainder of the term of the BDCP following completion of each restoration increment as described in CM 11 Natural Communities Enhancement and Management.

7.1.2.3 Conservation Measure 6 Channel Margin Habitat Enhancement

The implementation schedule assumes that channel margin enhancements will be completed in increments of 5 miles of channel (achieved at multiple sites for a total of 5 miles of channel margin length) by years 10, 20, 25, and 30 and that channel margin enhancement will be a component of seasonally inundated floodplain and riparian habitat restoration. Each channel margin habitat enhancement increment will, on average, require 5 years to identify potential channel margin enhancement sites; coordinate planning with USACE, DWR, and other flood control agencies and

reclamation districts; and conduct feasibility studies prior to implementation. Following approval of enhancement plans, an additional 5 years are assumed to be required to obtain any outstanding regulatory approvals and permits, develop bid specifications and drawings, and implement channel margin enhancements.

The implementation schedule assumes that monitoring and management of enhanced channel margin habitats will occur over the remainder of the term of the BDCP following completion of each restoration increment as described in CM 11 Natural Communities Enhancement and Management.

7.1.2.4 Conservation Measure 7 Riparian Habitat Restoration

Restoration of riparian habitat will be a component of tidal habitat restoration, seasonally inundated floodplain restoration, and channel margin habitat enhancement projects; therefore, the schedule for planning, site acquisition, environmental compliance, and implementation of riparian restoration actions is the same as the implementation schedule for those tidal, floodplain, and channel margin habitat restoration actions. The amount of riparian habitat restored varies greatly among the three restoration types. The preponderance of the 5,000 acres of riparian habitat to be restored will be performed in conjunction with seasonally inundated floodplain restoration and tidal habitat restoration in the south Delta.

Figure 6-9 shows the timing of adverse effects of construction activities on existing riparian habitats in relation to when riparian restoration actions would be implemented. There is a temporal loss of habitat function as a result of the time lag between when riparian habitats are affected and when restored riparian habitat becomes functional as habitat for associated covered species (Figure 6-9).

The implementation schedule assumes that monitoring and management of restored riparian habitat will occur over the remainder of the term of the BDCP following completion of each restoration increment as described in CM 11 Natural Communities Enhancement and Management. Figure 6-10 illustrates how restored riparian habitats are expected to evolve from riparian scrub to riparian forest and to develop habitat functions that support covered species over time. A description of methods used to identify riparian habitat maturation rates is provided in Appendix N.2, *Riparian Habitat Succession*.

7.1.2.5 Conservation Measure 8 Grassland Communities Restoration

[***Note to reviewers:*** *CM 8 is being revised. This section will be revised consistent with those changes.*]

The implementation schedule assumes that all grassland habitat restoration actions will be implemented between years 3 and 30. A total of 1,000 acres of grassland will be restored in the near-term implementation period, 250 acres in the early long-term implementation period, and 750 acres in the late long-term implementation period. The implementation schedule assumes that site acquisition, planning, and regulatory compliance-related activities for the first 250 acres of grassland restoration to be completed in year 3 are initiated in the first year following BDCP authorization, and those implementation elements require a total of 2 years to complete. All subsequent restoration increments also require a 2-year period to complete site acquisition, planning, and regulatory compliance prior to implementing restoration actions.

Figure 6-5 shows the timing of adverse effects of BDCP activities on existing grassland habitats in relation to when grassland restoration actions are implemented. The implementation schedule assumes that monitoring and management of restored grassland habitat will occur over the

remainder of the term of the BDCP following completion of each restoration increment as described in CM 11 Natural Communities Enhancement and Management.

7.1.2.6 Conservation Measure 9 Vernal Pool Complex Restoration

[***Note to reviewers:*** *CM 9 is being revised. This section will be revised consistent with those changes.*]

The implementation schedule assumes that all vernal pool complex habitat restoration actions will be implemented between years 2 and 15. A total of 116 acres of vernal pool complex will be restored in the near-term implementation period, 42 acres in the early long-term implementation period, and 42 acres in the late long-term implementation period. The implementation schedule assumes that site acquisition, planning, and regulatory compliance-related activities for the first 58 acres of vernal pool complex restoration to be completed in year 2 are initiated before BDCP authorization, and those implementation elements require a total of 3 years to complete. All subsequent restoration increments also require a 3-year period to complete site acquisition, planning, and regulatory compliance prior to implementing restoration actions.

Figure 6-3 shows the timing of adverse effects of BDCP activities on existing vernal pool complex habitats in relation to when vernal pool complex restoration actions are implemented. The implementation schedule assumes that monitoring and management of restored vernal pool complex will occur over the remainder of the term of the BDCP following completion of each restoration increment as described in CM 11 Natural Communities Enhancement and Management.

7.1.2.7 Conservation Measure 10 Nontidal Marsh Restoration

The implementation schedule assumes that all nontidal freshwater marsh restoration actions will be completed by year 9 in the near-term implementation period. The restored nontidal freshwater marsh will be designed specifically to support giant garter snake habitat and would be completed in the near-term implementation period to provide benefits for this endangered species as early as practical. The implementation schedule assumes that site acquisition, planning, and regulatory compliance–related activities for each 100 acres of restoration require 2 years to complete, with the restoration actions being completed in the third year.

The implementation schedule assumes that monitoring and management of restored nontidal freshwater marsh will occur over the remainder of the term of the BDCP following completion of each restoration increment as described in CM 11 Natural Communities Enhancement and Management.

7.1.2.8 Conservation Measure 11 Natural Communities Enhancement and Management

This conservation measure applies to all BDCP protected and restored habitats and is implemented at the time each parcel of land is acquired for the BDCP conservation lands system. Within 2 years of acquisition of conservation land parcels, the Implementation Office will conduct surveys to collect the information necessary to assess the ecological condition and function of conserved species habitats and supporting ecosystem processes (note that such surveys would be in addition to due-diligence biological and physical surveys conducted prior to site acquisitions; see Chapter 3, *Conservation Strategy*). Based on results of the assessment, the Implementation Office will develop management plans that describe habitat enhancement and management actions necessary to achieve the biological objectives established for the preserve lands addressed by each plan. These

management plans may be prepared for specific parcels or for multiple preserved parcels within a specified geographic area. Subsequent habitat enhancement and management actions will be implemented in accordance with the preserve-specific habitat enhancement and management schedule for each plan.

7.1.2.9 Conservation Measure 12 Methylmercury Management

[***Note to reviewers:*** *CM 12 is being revised. This section will be revised consistent with those changes.*]

This conservation measure provides specific tidal habitat restoration design elements to reduce the potential for methylation of mercury and its bioavailability in tidal habitats. Consequently, this conservation measure is implemented as part of the tidal habitat restoration design schedule indicated in Figure 6-1.

7.1.2.10 Conservation Measure 13 Nonnative Aquatic Vegetation Control

This conservation measure provides for control of nonnative aquatic vegetation in subtidal habitats restored as a component of BDCP tidal habitat restoration actions. The implementation schedule assumes that nonnative aquatic vegetation–control actions will be required at each tidal habitat restoration site immediately following restoration, and in some cases sites may require treatment prior to initiating restoration. Because current nonnative aquatic vegetation-control methods are dependent on the use of herbicides, the implementation schedule assumes 1 year to complete planning and environmental compliance for the first tidal habitat restoration to be initiated in year 2 and that nonnative aquatic vegetation control would begin following restoration of tidal exchange. Thereafter, the schedule assumes that planning and environmental compliance processes will be streamlined, requiring no more than 2 years to complete, and will run concurrent with planning and compliance elements conducted for each of the subsequent tidal habitat restoration actions.

7.1.3 Species-Level Other Stressors Conservation Measures

7.1.3.1 Conservation Measure 14 Stockton Deep Water Ship Channel Dissolved Oxygen Levels

The implementation schedule assumes the current Stockton Deep Water Ship Channel dissolved oxygen diffuser demonstration project will be implemented immediately following BDCP authorization (i.e., continued operation). The implementation schedule assumes the dissolved oxygen diffuser technology will need to be modified to provide substantial biological benefits for the covered fish species. The implementation schedule also assumes completion of a demonstration study by the end of year 1 that will provide guidance on how to modify the diffusers. Additional planning, coordination, environmental compliance, and construction are assumed to require an additional 2 years, and assuming modifications are necessary, the modified dissolved oxygen diffusion facilities would become operational in year 4, with operations continuing over the term of the BDCP.

7.1.3.2 Conservation Measure 15 Predator Control

The implementation schedule assumes that predator control actions to remove artificial structures and abandoned boats from Delta channels will require 2 years of planning and environmental compliance, with actions being implemented in year 3. Authorizations to implement actions to

remove nonnative predatory fish from specific locations are assumed to be completed in the first year following BDCP authorization and implemented in year 3. Following the first year of their implementation, predator control actions are assumed to be implemented annually over the term of BDCP.

7.1.3.3 Conservation Measure 16 Nonphysical Fish Barriers

The existing nonphysical fish barrier serving as a pilot project at the head of Old River is assumed to continue to be operated immediately following BDCP implementation. Planning and compliance activities for placing barriers at the Delta Cross Channel and Georgiana Slough are assumed to be initiated in the year following BDCP approval, requiring 2 years to complete, followed by construction and operation in the third year. The schedule assumes that up to four additional barriers may be constructed and operated if studies indicate substantial benefits for the covered fish species. The implementation schedule assumes 2 years of studies will be conducted following BDCP authorization and, assuming the studies indicate the placement of barriers will be beneficial, that 2 years will be required for planning and compliance and 1 year for construction as described above for the initial barriers.

7.1.3.4 Conservation Measure 17 Illegal Harvest

The implementation schedule assumes that planning and coordination with California Department of Fish and Game (DFG) and the existing Delta-Bay Enhanced Enforcement Program (DBEEP) necessary to expand DBEEP staffing will immediately follow BDCP authorization such that the conservation measure is implemented by the end of year 2. The funding for enhanced staffing support is assumed to be maintained over the term of the BDCP.

7.1.3.5 Conservation Measure 18 Conservation Hatcheries

The implementation schedule assumes that site acquisition, planning, and environmental compliance necessary for construction of the new DFG conservation hatchery facility will require 3 years following BDCP authorization, that an additional 2 years will be necessary for construction, and that the facility will become operational in year 6. Planning and environmental compliance necessary for the expansion of the University of California at Davis (UC Davis) conservation hatchery are assumed to be initiated before BDCP authorization such that the facility expansion is completed by the end of the second year of BDCP implementation, becoming operational in the year 3 of implementation. Both the U.S. Fish and Wildlife Service (USFWS) and the UC Davis facilities are assumed to be operated over the term of the BDCP once they have become operational.

7.2 Compliance and Progress Reporting

The BDCP Implementation Office will prepare, on a regular basis, planning documents and implementation reports to demonstrate compliance with the BDCP and its associated authorizations and to facilitate interagency coordination, scientific exchange, and public outreach. Under the ESA, habitat conservation plans (HCPs) are required to establish monitoring programs to assess the effects of plan implementation on covered species (50 Code of Federal Regulations [CFR] 17.22(b)(3) and 50 CFR 222.307(b)(5)). In addition, the USFWS/National Marine Fisheries Service (NMFS) Five-Point Policy (65 *Federal Register* [FR] 106, June 1, 2000) recommends that such plans provide annual reporting on matters related to compliance with permit terms and conditions.

Similarly, the NCCPA requires that implementation agreements include "provisions for periodic reporting to wildlife agencies and the public for purposes of information and evaluation of plan progress" (California Fish and Game Code 2820(b)(7)). The Implementation Office will, over the term of the BDCP, submit various reports and plans to the fish and wildlife agencies that serve the following purposes.

- Provide the necessary data and information to demonstrate that the BDCP is being properly implemented.
- Identify the effect of BDCP implementation on covered species and on the effectiveness of the conservation strategy at advancing the BDCP biological goals and objectives.
- Document actions taken under the Adaptive Management and Monitoring Program (e.g., process, decisions, changes, results, corrective actions).
- Disclose issues and challenges concerning BDCP implementation, and identify potential modifications or amendments to the BDCP that would increase the likelihood of success.
- Describe schedule and cost related to the implementation of actions over 1-year and 5-year timeframes.

Throughout the course of BDCP implementation, the Implementation Office will prepare and submit to the fish and wildlife agencies the following documents, as described in this chapter.

- Annual Workplan and Budget
- Annual Water Operations Strategy
- Annual Progress Report
- Annual Water Operations Report
- Five-Year Comprehensive Review
- Five-Year Implementation Plan

The Implementation Office will work in partnership with DWR, U.S. Department of the Interior Bureau of Reclamation (Reclamation), USFWS, NMFS, DFG, the BDCP Stakeholder Committee, the Delta Stewardship Council, and the Delta Science Program in the development of these planning and reporting documents. The totality of these documents will enable the range of interested public and private stakeholders, and the general public, to assess on an ongoing basis the progress and performance of the BDCP toward meeting its biological goals and objectives and make informed recommendations to the Implementation Office regarding matters relating to plan implementation. To accommodate access to this information, these reports will be available to the public and posted on the BDCP website.

7.2.1 Annual Workplan and Budget

Annually[1], the Implementation Office will prepare a workplan and budget for the upcoming implementation year. The workplan will identify planned actions for the implementation of conservation measures and the Adaptive Management and Monitoring Program. The budget will set out the anticipated expenditures and identify the sources of funding for those expenditures. A final

[1] The Implementation Office will decide how the planning year will be bounded (e.g., calendar year, federal fiscal year, state fiscal year, or water year).

Annual Workplan and Budget will be completed no later than 1 month prior to the beginning of the implementation year. A draft of the Annual Workplan and Budget will be provided to BDCP Implementation Board and the BDCP Stakeholder Committee for review no later than 1 month prior to the due date for the final plan.

At a minimum, the Annual Workplan and Budget will contain the following information.

- A description of the planned actions (including anticipated adaptive management changes) to implement conservation measures (for water operations conservation measures, see Section 6.2.2, *Annual Water Operations Strategy*) and the entities that will carry out the actions.
- A description of the planned monitoring actions and the entities that will implement those actions.
- A description of the anticipated research studies to be undertaken and the entities that will conduct the studies.
- A budget reflecting the costs of implementing the planned actions, including a line item for each specific action.
- A description of the sources of funding to support the budget.

7.2.2 Annual Water Operations Strategy

The Implementation Office will work closely with State Water Project (SWP) and Central Valley Project (CVP) operation managers to ensure the proper implementation of water operations conservation measures, which take effect when the proposed north Delta diversion and conveyance facilities become operational. DWR and Reclamation will retain their authority and obligation to determine overall water project operations consistent with their various permit terms and conditions and other applicable requirements. DWR and Reclamation will conduct Delta operations in close coordination with DFG, USFWS, and NMFS and in accordance with permitted operating criteria, and consistent with the following planning processes.

Beginning in the year prior to operations of the proposed north Delta diversion and conveyance facilities (assumed to be year 9), and no later than December 15 each year, DWR, Reclamation, DFG, USFWS, and NMFS will develop a Water Operations Strategy, including provisions for seasonal variations, that identifies the following elements.

- Operations priorities for both fisheries and water supply for the coming year.
- Expected operations or "most likely" criteria that will guide operations within the real-time operations ranges established in the water operations conservation measures.
- Monitoring, data collection, research, and adaptive management experiments associated with that water year's water operations.

The BDCP Science Manager will use prior years' Annual Water Operations Reports to inform development of the Annual Water Operations Strategy. The Science Manager will seek independent science input on an initial draft of the Annual Water Operations Strategy to be submitted for review to an independent science panel in an open, public forum. The independent science panel will review the draft plan and provide a comprehensive written review of the draft plan.

The Annual Water Operations Strategy will include the first of three Seasonal Operations Strategies. No later than December 31, March 31, and July 31 of each year, DFG, USFWS, and NMFS will

seasonally evaluate then-current hydrologic and fishery information and will update the expected operating criteria within the real-time operations range, as necessary. Based on this information, DWR and Reclamation will prepare Seasonal Operations Strategies that update their operating forecasts and expected water supply projections. The Seasonal Operations Strategies documents will be completed no later than January 15, April 15, and August 15.

7.2.3 Annual Progress Report

At the end of each implementation year[2], the Implementation Office will prepare an Annual Progress Report. These reports will provide a summary of the activities carried out during the previous implementation years. The Annual Progress Report, for instance, will include a description and accounting of land acquisitions and habitat restoration activities and an update on the status of the monitoring and research programs, including a discussion of the synthesis and use of data and information and the identification of important trends. Annual reports will be completed within 3 months of the close of the reporting year, which will provide sufficient time to compile data and complete analyses.

The annual reports will include the following elements.

1. Documentation of the implementation of habitat conservation measures (i.e., protection/enhancement/creation/restoration) in relation to the implementation schedule set out in Section 6.1, *Plan Implementation Schedule*, including:

    a. A summary of the completed or in-progress conservation actions, including information related to type, extent, and location of protected, enhanced, and restored natural communities and modeled habitat for covered species[3]. This summary will identify the lands acquired and the restoration and enhancements actions undertaken over the year, and describe the covered species that are expected to benefit from each action. The report will document this on an annual and cumulative basis.

    b. A summary of all land management activities undertaken on BDCP conservation lands, including a description of the management issues facing the Implementation Office at each preserve unit.

    c. The status of the BDCP conservation lands system assembly and an assessment of the progress toward all acquisition goals, including those related to natural communities, landscape linkages, covered plant populations, and wetland protection. This assessment will include evaluation of compliance with the reserve design and assembly principles as described in Chapter 3, *Conservation Strategy*.

    d. Identification of habitat conservation actions that have not been implemented in accordance the implementation schedule (i.e., actions that are either behind or ahead of the implementation schedule) and an explanation for the deviation from the schedule.

[2] The Implementation Office will decide how the implementation year will be bounded (e.g., calendar year, federal fiscal year, state fiscal year; or water year).

[3] Species habitat distribution models may change over the course of the plan as understanding of species' ecology improves. However, loss of modeled habitat for covered species will be reported based on models at the time of plan approval to ensure consistent tracking throughout the permit term,

2. A summary of the water operations conservation measures implemented during the prior year (a detailed description of water operations will be included in the Annual Water Operations Report [Section 6.2.4]), including:
    a. Documentation of compliance with the water operation criteria in effect during the reporting period.
    b. Documentation and rationale for any deviations from the water operation criteria in effect during the reporting period.
    c. Documentation of real-time operational decisions.
    d. Documentation of Fremont Weir operations, including:
        1) Periods of operation
        2) Flow volume by operation period
        3) Documentation and rationale for any deviations from the Fremont Weir operation ranges in effect during the reporting period
3. A description of the implementation of covered activities and their effects on natural communities and covered species, including:
    a. An assessment of nature and extent of the impacts of covered activities on covered natural communities and covered species. The report also will contain:
        1) A brief description of the covered activity and the entity that carried out the covered activity.
        2) The location of a natural community or covered species modeled habitat permanently or temporarily disturbed.
        3) The identity and location of any known occurrences of covered species disturbed or lost to covered activities.
    b. A brief description of the type, extent, and location of measures implemented to avoid and minimize the potential impacts of covered activities on covered species during the reporting period.
    c. A summary of the overall level of impacts in the current year, a summation of impacts of all prior years of BDCP covered activities on covered natural communities and modeled habitat for covered species, and a description of how implementation of conservation measures is roughly proportional in time and extent to the impacts on natural communities and modeled habitat for covered species.
4. An evaluation of the results of monitoring and research activities, including:
    a. A description of the ecosystem/landscape–level, natural community–level, and species-level monitoring activities (as described in Section 3.6, *Monitoring and Research Program,* or in monitoring plans subsequently developed during implementation) undertaken during the reporting period and a summary of monitoring results with appropriate assessment of population trends and status of covered species.
    b. A description of all directed research conducted by the BDCP during the reporting period and a summary of research results to date.
5. A description of adaptive management activities, including:

a. A description of the adaptive management decisions made during the reporting period, including how existing information was used to guide these decisions and the rationale for the action.

b. A description of the use of independent scientists or other experts in the adaptive management decision-making processes.

c. A description of adopted and recommended changes to the operating conservation program based on interpretation of monitoring results and research findings.

6. A financial report describing funds provided to the Implementation Office by source; annual and cumulative expenditures by cost category; deviations in expenditures from the annual budget; and other relevant information as appropriate (a detailed financial report will be included in the Annual Workplan and Budget [Section 6.2.1]).

7. A description of actions implemented or pending to respond to changed circumstances, including:

   a. A description of the changed circumstance and its effects on covered species and natural communities.

   b. A description of the actions taken to address the changed circumstance and the effectiveness of those actions, including the outcomes of actions to address changed circumstances from earlier years.

8. A summary of any administrative changes, minor modifications, or major amendments to the plan proposed or approved during the reporting period.

7.2.4 Annual Water Operations Report

Beginning in the first year that the proposed north Delta diversions and conveyance become operational, and no later than November 15 of each year, DWR and Reclamation, with participation from DFG, USFWS, and NMFS, will prepare a Water Operations Report on the prior water year's (October 1 to September 30) operational effects on covered species. The report will include the following components.

- A summary of the prior year's operations, including a comparison of the actual operations with planned operations.
- A discussion of new data collected and information from new scientific research.
- Evaluation of the effectiveness of actions for covered fish species and ecological processes, including the responses to real-time operational changes.
- Description of the extent to which water supply projections in the prior year's Annual and Seasonal Operations Strategies were met, and if not met, identification of factors affecting the ability to meet projections.
- Consideration of whether any protective actions should be altered in light of new information, an inability to meet fishery protection, or water supply reliability targets.

The Science Manager will seek independent science input on the draft of the Water Operations Report.

7.2.5 Five-Year Comprehensive Review

The implementation of the BDCP will be subject to a comprehensive review every 5 years throughout the term of the plan. As part of this review, the Implementation Office will prepare a report, known as the Five-Year Comprehensive Review, which memorializes the findings of this review.

The objectives of the Five-Year Comprehensive Review are as follows.

- To provide an overview of the status of BDCP implementation, including implementation of conservation measures and the progress made toward meeting biological goals and objectives.
- To assess covered species trends and habitat conditions associated with BDCP implementation relative to overall trends and conditions for covered species and natural communities based on all relevant information (i.e., not limited to BDCP data and reports).
- To evaluate the relevance of the various monitoring actions and research projects to the implementation of conservation measures.
- To evaluate changes that have been made in the implementation of the BDCP and set out potential modifications that may be advisable in the future based on new information and lessons learned.

The primary purpose of the Five-Year Comprehensive Review is to provide a periodic, program-level assessment of the progress made under the BDCP toward achieving the biological goals and objectives. As such, the review will be focused on identifying and evaluating broad ecological trends in the Delta, including covered species abundance, variability, distribution, and population growth rate; ecological processes and stressors such as hydrodynamics, foodwebs, and contaminants; natural community distribution, function, and diversity; habitat restoration extent and functionality; and other relevant measures.

In contrast to the annual report, the Five-Year Comprehensive Review will require significant analysis and synthesis of data collected over time, using data and information compiled from various sources. Five-Year Comprehensive Reviews will include critical evaluations of the assumptions and model outputs upon which the BDCP has been based and of the efficacy of the conservation measures in light of monitoring data and the analysis and synthesis of information through the adaptive management process.

The Five-Year Comprehensive Review also will include an evaluation of the BDCP monitoring program, assessing such issues as the program's capacity to adequately measure the BDCP's progress toward achieving biological goals and objectives. The review will discuss the lessons that have been learned during the course of implementation and reach conclusions regarding how best to approach monitoring into the future. The review also will afford an opportunity to evaluate the BDCP biological goals and objectives and assess their continued relevance in light of new information that has become available.

The Five-Year Comprehensive Review will be developed in close coordination with the Interagency Ecological Program (IEP), Delta Science Program, and Independent Science Board. The Implementation Office will work with the IEP lead scientist and science manager for the Delta Science Program to consolidate data and information from a range of sources. The review may be scheduled to coincide with the Delta Science Conference to capitalize on the gathering of the community of scientists engaged in Delta issues.

The Implementation Office will post the Five-Year Comprehensive Review on the BDCP website and include a summary of the review to assist stakeholders and the public in their review of the report.

7.2.6 Five-Year Implementation Plan

Based on the Five-Year Comprehensive Review, the Implementation Office will prepare a Five-Year Implementation Plan that covers the upcoming 5 years. In contrast to the Annual Workplan and Budget, the Five-Year Implementation Plan will focus more broadly on potential future conservation actions and adaptive management changes, other potential modifications to the BDCP, and the significance of ecological trends. At a minimum, the Five-Year Implementation Plan will contain the following information.

- Description of adaptive management changes to BDCP implementation of conservation measures, monitoring, research, and program administration.
- Modifications, if necessary, to biological goals and objectives.
- Identification of any changes to the BDCP that may require amendments to the permits or other authorizations.
- Summary of the planned actions and schedule to implement conservation measures.
- Description of the long-term and system-wide monitoring actions and anticipated research studies.
- Summary budget projection reflecting the costs of implementing the planned actions.

In years when Five-Year Plans are prepared, the Annual Workplan and Budget may be included within or prepared separately from the Five-Year Plan.

7.3 Regulatory Assurances and Changed Circumstances and Unforeseen Circumstances

7.3.1 Regulatory Assurances

ESA regulations and provisions of the NCCPA provide for regulatory and economic assurances to parties covered by approved HCPs or Natural Community Conservation Plans (NCCPs) concerning their financial obligations under a plan. Specifically, these assurances are intended to provide a degree of certainty regarding the overall costs associated with species mitigation and other conservation measures, and add durability and reliability to agreements reached between Proposed Authorized Entities and the fish and wildlife agencies. That is, if unforeseen circumstances occur that adversely affect species covered by an HCP or NCCP, the fish and wildlife agencies will not require additional land, water, or financial compensation or impose additional restrictions on the use of land, water, or other natural resources.

The assurances provided under the ESA and the NCCPA do not prohibit or restrain USFWS, NMFS, DFG, or any other public agency from taking additional actions to protect or conserve species covered by an NCCP or HCP. The state and federal agencies may use the variety of tools at their disposal and take actions to reduce the effects of other stressors to ensure that the needs of species affected by unforeseen events are adequately addressed.

7.3.1.1 Regulatory Assurances under the Endangered Species Act—The No Surprises Rule

Under the No Surprises rule (63 FR 8859, Feb. 23, 1998), once an incidental take permit has been issued pursuant to an HCP, and its terms and conditions are being fully implemented, the federal government will not require additional conservation or mitigation measures, including land, water (including quantity and timing of delivery), money, or restrictions on the use of those resources (63 FR 8868),[4]. If the status of a species addressed under an HCP unexpectedly declines, the primary obligation for undertaking additional conservation measures rests with the federal government, other government agencies, or other non-federal landowners who have not yet developed HCPs. As explained by the federal fish and wildlife agencies:

> Once an HCP permit has been issued and its terms and conditions are being fully complied with, the permittee may remain secure regarding the agreed upon cost of conservation and mitigation. If the status of a species addressed under an HCP unexpectedly worsens because of unforeseen circumstances, the primary obligation for implementing additional conservation measures would be the responsibility of the Federal government, other government agencies, and other non-Federal landowners who have not yet developed an HCP (63 FR 8867).

However, the federal fish and wildlife agencies may, in the event of unforeseen circumstances, require additional measures provided they are limited to modifications in conserved habitat areas or to the conservation plan's operating conservation program for the affected species, and that these measures do not involve additional financial commitments or resource restrictions without the consent of the permittee. These assurances are provided to all HCP permittees that properly implement their plans. The No Surprises rule, however, does not apply to Reclamation, which will use the BDCP as the basis for a biological assessment (BA) to support the issuance of take authorizations from USFWS and NMFS pursuant to Section 7 of the ESA for its actions in the Delta.

The assurances provided by the No Surprises rule, however, are not absolute and are tempered by other regulatory provisions of the ESA. The Permit Revocation rule moderates the scope of the No Surprises rule, providing that in instances where a species covered by an HCP is threatened with extinction, assurances may be nullified and USFWS may revoke the HCP permit (50 CFR 17.22(b)(8)). The federal fish and wildlife agencies may exercise this authority even if a permittee is in compliance with the terms and conditions of the permit, provided the permitted activity would appreciably reduce the likelihood of the survival and recovery of the species in the wild (69 FR 71723, 71727; December 10, 2004).

7.3.1.2 Regulatory Assurances under the Natural Community Conservation Planning Act

Under the NCCPA, DFG provides assurances to permittees commensurate with the long-term conservation assurances and associated implementation measures that will be implemented under the plan.[5] In its determination of the level and term of the assurances to be afforded a permittee, DFG takes into account the conditions specific to the plan, including such factors as: the level and quality of information regarding covered species and natural communities, the sufficiency and use of the best available scientific information in the analysis of impacts on these resources, reliability of

[4] The No Surprises rule was promulgated jointly by the Department of the Interior (Service) and the Department of Commerce (National Marine Fisheries Service).

[5] Fish and Game Code 2820 (f) states "*The department may provide assurances for plan participants commensurate with long-term conservation assurances and associated implementation measures pursuant to the approved plan.*"

mitigation strategies, and appropriateness of monitoring techniques, including the use of centralized information to evaluate the effectiveness of the plan; the adequacy of funding assurances; the range of foreseeable circumstances that are addressed by the plan; and the size and duration of the plan.[6]

The assurances provided to the entities receiving permits under the NCCPA will, at a minimum, ensure that if there are unforeseen circumstances, no additional financial obligations or restrictions on the use of resources will be required of the permittees without their consent. Specifically, the NCCPA directs that,

> [i]f there are unforeseen circumstances, additional land, water, or financial compensation or additional restrictions on the use of land, water, or other natural resources shall not be required without the consent of plan participants for a period of time specified in the implementation agreement, unless [DFG] determines that the plan is not being implemented consistent with the substantive terms of the implementation agreement (California Fish and Game Code 2829(f)(2)).

However, like the provision in the ESA regulations, the NCCPA requires that DFG suspend or revoke a permit, in whole or in part, if the continued take of a covered species would jeopardize its continued existence.

7.3.2 Changed Circumstances

*[**Note to reviewers:** This version of "Changed Circumstances" has been completely revised from that presented in the November 18, 2010 BDCP draft; therefore changes are not shown.]*

Ecological conditions in the Delta are likely to change as a result of future events and circumstances that may occur during the course of the implementation of the BDCP. This section of the BDCP identifies changes in circumstances that are reasonably foreseeable and that could adversely reserve system lands or waters in the Plan Area, consistent with the "changed circumstances" provisions of ESA regulations and in the NCCPA. To ensure successful implementation of the BDCP conservation strategy, the Plan further sets out measures designed to respond to these anticipated future changes.

In the context of the ESA, changed circumstances are defined as "changes in circumstances affecting a species or geographic area covered by a conservation plan that can reasonably be anticipated by plan developers and the [USFWS and NMFS] and that can be planned for." The NCCPA similarly defines changed circumstances as "reasonably foreseeable circumstances that could affect a covered species or geographic area covered by the plan" (50 CFR 17.3, 50 CFR 222.102, and California Fish and Game Code 2805(c).

This section identifies the specific changed circumstances that reasonably be expected to occur in the Plan Area during the course of plan implementation and that may compromise the effectiveness of the conservation actions set out in the BDCP. The section further describes the responses that will be implemented through the BDCP to adequately address such events and their potential to prevent or impede the BDCP from achieving anticipated biological outcomes. The specific approaches and steps related to many of the planned responses largely will be developed and implemented through the adaptive management and monitoring program (Section 3.6) (U.S. Fish and Wildlife Service and National Marine Fisheries Service 1996). However, for certain changed circumstances, responsive actions will fall outside the scope of the adaptive management and monitoring program; these actions are specifically described in this section. The planned responses to changed circumstances

[6] DFG bases its determination of the level of assurances on multiple factors. See Fish and Game Code 2820(f).

have been designed to be practical and roughly proportional to the impacts of covered activities on covered species and natural communities, yet sufficient to effectively address such events.

The following describes the BDCP process for identifying the occurrence of changed circumstances, the changed circumstances that will be addressed by the BDCP, and measures that will be implemented in response to such occurrences.

7.3.2.1 Process to Identify Changed Circumstances

The occurrence of a changed circumstance will generally be identified by the Implementation Office through information obtained from system-wide or effectiveness monitoring, scientific study, or information provided by another party. Once the Implementation Office has become aware that a changed circumstance has occurred or is likely to occur, it will take immediate steps to investigate and confirm the event. If a changed circumstance appears to have occurred, the Implementation Office will contact the fish and wildlife agencies to inform them of the changed circumstance. The Implementation Office will also notify the BDCP Implementation Board, the Implementation Council, and the Stakeholder Council of the change in circumstances.

After documenting the occurrence of a changed circumstance, the Implementation Office will determine specific responsive actions that are consistent with the requirements set out in this section and develop a schedule for their implementation. The Implementation Office will confer with the fish and wildlife agencies regarding the details of the response and a timeframe for implementation. For actions implemented through the adaptive management and monitoring program, the decision-making process described in Section 3.5, *Adaptive Management and Monitoring Program*, will be used. After implementing these actions, the Implementation Office will monitor their effectiveness and report the associated results and findings through the annual reporting process.

7.3.2.2 Changed Circumstances Related to the BDCP

The following changed circumstances are described and will be addressed in implementation if they occur:

- Levee failures
- Flooding
- Failure of water operations infrastructure
- New species listing
- Wildfire
- Toxic or hazardous spills
- Nonnative invasive species
- Climate change

The Implementation Office will be required to respond to all changed circumstance events that meet the changed circumstances criteria as defined in the following sections.

7.3.2.2.1 Levee Failures

Nature of Changed Circumstance

During the course of BDCP implementation, it is expected that levee failures will occur in the Plan Area, and that such failures may compromise or eliminate the benefits provided by some reserve system lands or by some conservation measures. Levees in the Delta sometime fail as a result of events or conditions such as earthquakes, flooding, and structural inadequacy (also known as "sunny day events") (California Department of Water Resources 2009, 2011). Such failures are considered a changed circumstance under the BDCP if the failure meets any of the following criteria.

- Diminishes significantly the function of reserve system lands, as jointly determined by the Implementation Office and the fish and wildlife agencies.
- Precludes implementation of conservation measures.
- Impedes the implementation of water operations conservation measures.

The susceptibility of reserve system lands and water operations facilities to impacts associated with levee failures depends on where these areas and facilities are located. For instance, vernal pool complexes in Conservation Zones 1 and 11 (up to XX acres) will be among the reserve lands vulnerable to flooding caused by a levee failure, as will alkali seasonal wetland, other natural seasonal wetland, managed wetlands, grassland, and agricultural natural community types. As such, one or more levee failure events affecting up to XX acres of vernal pool complexes, XX acres of alkali seasonal wetland, XX acres of other natural seasonal wetland, XX acres of managed wetlands, or XX acres of agricultural land will be considered a changed circumstance. It is foreseeable that a single levee failure event will affect restoration within a single Restoration Opportunity Area (ROA). Depending on the location and number of levee failures, the function and extent of restored tidal habitat restoration could be diminished or restoration opportunities precluded. Natural community enhancement or restoration in floodplains could be damaged if levee failure occurs before riparian plantings become established. A single levee failure event could temporarily impede implementation of water operation conservation measures either in the north or south Delta, but not both simultaneously. The Implementation Office will be required to implement corrective actions for all changed circumstance events that meet this definition.

*[**Note to reviewer:** Tidal habitat restoration configurations in Conservation Zones 1 and 11 are not finalized. BDCP levees may be constructed to protect vernal pool complexes from restored tidal habitat. If levees are not required, then impacts to vernal pools as a changed circumstance will be removed. This analysis will be expanded to include floodplain areas, managed, or agricultural areas that could be affected by levee failure once the conservation strategy for those components is complete.]*

Rationale

Different types of events are likely to cause different kinds of levee failures, which result in different types of effects. A single external event may cause the failure of one or more levees, causing the flooding of one or more islands or tracts in tidally influenced areas. An earthquake or large peak flow event may result in multi-levee failure and multi-island or multi-tract flooding (California Department of Water Resources 2009). A sunny day event is more likely to cause the failure of a single levee and affect areas in close proximity (California Department of Water Resources 2009). As such, levee failures hold the potential to cause widespread or localized flooding, which could extend to multiple islands or be confined to a levee subsection.

In most of the Delta, a levee failure causes the flooded area to become tidally influenced. The depth and extent of the flooded area will change with the tides. One or more levee failures could affect the volume of water that moves in and out of the area during the tidal cycle (i.e., the tidal prism). Multiple levee failures could expand the tidal prism enough to cause the high tide to be lower and/or the low tide to be higher than normal. Such changes, if not reversed by levee repair, could alter the distribution of tidally influenced natural communities, all of which are sensitive to small variations in depth, frequency, and duration of tidal inundation. Over a period of years, the affected natural communities will reach equilibrium with the new tidal range, but the end result will be changes in the distribution and acreage of each tidally influenced natural community.

Many BDCP conservation measures protecting or restoring habitat will be implemented in areas that are not within tidal elevation ranges, but some of these measures will occur in areas protected by and behind levees. Failure of those levees will compromise the function of these protection and restoration actions. Natural communities vulnerable to this impact depend on the final configuration of levee removal or relocation projects, but may include vernal pool areas in Conservation Zones 1 and 11, as well as certain areas of grassland, managed wetlands, and agricultural areas. If an adjacent levee breached, the function of these protected or restored communities could be diminished. If levee repair did not occur, these areas will change to natural communities associated with floodplains, such as valley/foothill riparian, grassland, alkali seasonal wetland, nontidal freshwater perennial emergent wetland, or seasonally-flooded agriculture.

Levees protect infrastructure required for implementation of water operations conservation measures. The dual conveyance system will allow operational flexibility if levee failure impedes water withdrawals from the north Delta or south Delta intakes; however, increased withdrawals may be required from the undamaged intakes. Levee failure could also restrict water delivery to the Yolo bypass and the level of flooding required for conservation measure implementation will be difficult to maintain. Due to the distance of the north Delta and south Delta facilities it is foreseeable that levee failure will impede water operations in the north Delta or south Delta, not both simultaneously. Levee repair will be required to ensure implementation of water operations conservation measures.

Levees also protect floodplains adjacent to waterways (e.g., along the San Joaquin River). Breaching of these levees is possible during flood events occurring during the rainy season. The effects of such flooding will likely be temporary because water will ultimately recede. Seasonally inundated floodplain restoration, channel margin habitat enhancement, or riparian habitat restoration may occur in levee-protected floodplains; however, the natural communities created by these efforts are adapted to and therefore resilient to flooding. They are shaped by their proximity to streams and are maintained by seasonal flooding in winter and spring and by drought in summer. Diminished function of these natural communities from levee failures is not anticipated; however, new riparian plantings may need to be replaced if levee failure results in their destruction.

Planned Responses

The two foreseeable scenarios described below involve the failure of levees that result in either the loss or degradation of habitat or create an impediment to the proper implementation of the conservation strategy, including the operation of the SWP/CVP. The remedial actions that will be undertaken to address such circumstances are described for each scenario. The scenarios cover those events that occur as a result of failures of BDCP levees and those that occur as a result of failure of non-BDCP levees.

Failure of levees constructed as part of the BDCP. BDCP levees will be designed and constructed to standards required by USACE and the jurisdictional flood management authority, to minimize the risk of failure. In the event of the failure of a BDCP-related levee, the Implementation Office will either repair the breached levee or undertake other measures that produce at least equivalent benefits for covered species and natural communities affected by the event. These measures will be consistent with the process and schedule identified in this section.

The Implementation Office will be responsible for undertaking, in a timely manner, an assessment of the levee failure, which will include the following actions.

- An evaluation of the effects of the failure on the covered species and natural communities addressed by the BDCP.
- A description of the proposed remedial actions.
- A process and schedule for their implementation.

The Implementation Office will evaluate the affected site to determine whether biological conditions for any of the covered species have been degraded and what, if any, corrective actions are necessary.

Corrective actions could occur at the affected site or at another location. Actions taken on site will likely include the repair of the levee, restoration of the affected site, or equivalent measures.

In most cases, levees will need to be repaired or replaced to maintain permit compliance. However, in cases where the levee does not need to be fixed, alternative sites may be protected or restored at lower cost and effort than required for levee replacement. Offsite corrective actions will require a different process and timeline than onsite actions. Offsite habitat restoration replacement will require the identification of a site suitable for a replacement project. The Implementation Office will identify and oversee the acquisition of an appropriate site and manage the planning, design, and permitting, if any, necessary to effectuate the project.

Failure of levees not constructed as part of a BDCP activity (non-BDCP levees). The Implementation Office will also be responsible for implementing remedial measures associated with the failure of non-BDCP-constructed levees when those failures adversely affect habitat protected through BDCP conservation actions, including by interfering with the operations of the projects, and will seek funding or reimbursement costs from the appropriate responsible entity. A similar process to that identified above for failure of BDCP-constructed levees will be followed. However, the schedule for remedial action implementation will likely be longer because of the necessary involvement of third parties with responsibility for the affected levee.

Several responsible flood management entities in the Plan Area manage non-BDCP levees (see Figure 2-17 for the locations of all non-BDCP levees). These entities include USACE and local water districts. State and federal levees in the Delta that are at risk of failure or that otherwise require repair or replacement are covered by the Levee Repairs Program under Section 821 of the Disaster Preparedness and Flood Prevention Bond Act of 2006 (Proposition 1E). Local agencies that maintain levees may seek funding assistance through the Local Levee Grant Program, which provides for cost-sharing arrangement between the state and local agencies for work done on sites deemed critical by DWR.

In the event of a non-BDCP levee breach, the Implementation Office will evaluate the affected site to determine whether covered species or their habitat have been adversely affected, or whether the breach had the potential to adversely affect aquatic habitats used by covered species. Adverse

effects could include reduced benefits to covered species from diminished conservation measures. The site of the levee failure will be evaluated to allow adequate time for the Implementation Office to contact and coordinate with the responsible flood management entity. For example, the Implementation Office may need to obtain permission from the local entity to access the property.

The Implementation Office will follow the same procedure for site assessment as it will for a BDCP-related levee failure. The Implementation Office will also coordinate with the responsible flood management entity to ensure that the entity participates in the remedial action to the extent necessary and appropriate. The local flood management entity, for instance, may be required to assume financial responsibility for the costs of the remedial action, including for the levee repair work and the restoration of the affected reserve system lands.

7.3.2.2.2 Flooding

Nature of Changed Circumstance

Flood events caused by excessive precipitation and that are of a magnitude up to a 100-year flood will be considered a changed circumstance if the flooding is determined to cause permanent loss of the ecological benefits provided by BDCP conservation measures. The Implementation Office will be required to implement corrective actions for all changed circumstance events that meet this definition.

Rationale

Flooding is a natural event in stream systems, having both beneficial and detrimental effects on natural communities. Seasonally inundated floodplain restoration, channel margin habitat enhancement, or riparian habitat restoration are resilient to flooding because they may occur in floodplains. These communities are shaped by their proximity to streams and are maintained by seasonal flooding in winter and spring and by drought in summer. Any adverse effects of flooding will likely be temporary because flood waters will ultimately recede. However, severe flooding along stream channels with new riparian plantings could destroy restoration sites.

Damage or destruction of facilities and infrastructure constructed to implement the conservation strategy due to flooding is not foreseeable. Facilities and infrastructure will be constructed outside of floodplains or to withstand a severe peak flow event.

Planned Response

The BDCP conservation strategy includes measures to reduce the risk of natural flooding of certain reserve system lands. Still, remedial measures may be necessary if flooding causes permanent loss of habitat values created through BDCP actions. The remedial measure implemented in response to a flood event less than the 100-year event will be to repair or replace the restoration site once flood water recedes, consistent with the conservation strategy described in Chapter 3 and any permits acquired for the original project (e.g., USACE permit).

7.3.2.2.3 Failure of Water Operations Infrastructure

Nature of Changed Circumstance

BDCP water operations conveyance facilities, including intake and fish-screening facilities, pumping facilities, and other appurtenant facilities, may malfunction or break down during the permit term,

necessitating altered or halted operations. A changed circumstance related to SWP/CVP water operations infrastructure located in the Plan Area will be deemed to have occurred in the event that a malfunction or breakdown of water operations conveyance facilities precludes or substantially inhibits the ability to manage water operations within the water operations criteria in effect at the time of the infrastructure failure. The Implementation Office will be required to implement corrective actions for all changed circumstance events that meet this definition. Failure of the pipelines, tunnels, or canals that comprise the principal conveyance facility is not reasonably foreseeable because of the nature of their planned construction and, therefore, any such event will be considered outside the scope of this changed circumstance.

Rationale

Proposed conveyance facilities will be designed in accordance with the current industry practice, design standards, and codes, and will comply with relevant regulatory requirements. The proposed facilities will be designed to last at least 50 years (design life) with periodic maintenance during operation. The water-operations infrastructure of the SWP/CVP will be routinely and diligently maintained to minimize the potential for failure. These designs, state-of-the art construction, and operations procedures make a failure or interruption of these facilities highly unlikely. The one exception would be a failure or interruption in the event of an extreme event such as a large earthquake. Therefore, although malfunction or breakdown is unlikely, it is reasonably foreseeable during the 50-year life of the permits.

Planned Response

In the unlikely event of a failure of infrastructure in the Plan Area, the Implementation Office will work with DWR or Reclamation to repair the affected facilities or make adjustments or modifications to other facilities to restore full operational capacity necessary to implement BDCP conservation measures, as soon as reasonable and practicable. The Implementation Office will also request DWR or Reclamation to temporarily adjust water operations in the adaptive range of water operations if such action is deemed necessary to minimize adverse effects on covered species to the extent practicable. Upon completion of facility repairs or alternative modifications to other infrastructure, operations will return to pre-existing levels, parameters, and water supply.

7.3.2.2.4 New Species Listings

Nature of the Changed Circumstance

USFWS, NMFS, or DFG may list additional species that occur in the Plan Area as threatened or endangered under the ESA or the California Endangered Species Act (CESA)[7]. In the event that a fish and wildlife agency lists a species not covered by the BDCP, the provisions of this changed circumstance will be triggered. The Implementation Office will be required to implement corrective actions for all changed circumstance events that meet this definition. A new species listing of a covered species will not trigger this changed circumstance because the Plan already anticipates such actions and take coverage for the newly-listed covered species will be automatic.

[7] A species designated by the State of California as a candidate for listing also receives regulatory protection during the review of the candidacy. As such, the provisions set out in this changed circumstance will apply to state-designated candidate species.

Planned Response

Upon a new listing of a species under state or federal endangered species laws not covered by BDCP, the Implementation Office will undertake the following measures:

- Evaluate the potential impacts of covered activities on the newly listed species and conduct an assessment of the presence of suitable habitat in areas of potential effect.
- Implement measures to avoid impacts on the newly listed species until such time as the BDCP has been amended to include the newly listed species as a covered species.

In the event that a species not covered by the BDCP becomes listed as threatened or endangered, is designated as a candidate species, or is proposed or petitioned for listing, the Implementation Office, on behalf of the Proposed Authorized Entities, may request that the appropriate fish and wildlife agency add the species to the relevant take authorizations issued pursuant to the BDCP. In determining whether to seek take coverage for the species, the Implementation Office will consider, among other things, whether the species is present in the Plan Area, whether the covered activities could result in incidental take of the species, and whether the existing conservation measures benefit the species and avoid and minimize effects of covered activities on the species. If incidental take coverage is sought, the BDCP and its authorizations will be amended. Alternatively, the Implementation Office, on behalf of the Proposed Authorized Entities, could seek new and separate take authorizations. The procedures for plan modifications and amendments are described in Section 6.4, *Permit Duration and Renewal, Plan Amendments, Permit Suspension and Revocation*.

7.3.2.2.5 Wildfire

Nature of Changed Circumstance

Wildfire will be considered a changed circumstance in the event that a fire not prescribed by the Implementation Office (i.e., as part of conservation strategy implementation in BDCP conservation lands) damages or destroys sufficient amounts of vegetation to substantially degrade the intended habitat functions of BDCP protected lands for covered species. The Implementation Office and the fish and wildlife agencies will jointly determine the nature and extent of habitat loss resulting from the fire.

Rationale

Fire-adapted natural communities in BDCP conservation lands include grassland and inland dune scrub, totaling at least 8,000 acres in the conservation lands. Other natural communities in the BDCP conservation lands are not fire-adapted or fire-prone because of their low fuel loads and high moisture context (e.g., agricultural lands, wetlands, riparian areas). Wildfire in grassland or inland dune scrub is unlikely to substantially degrade these communities because they are both fire-adapted early successional natural communities. Because of the layout of BDCP conservation lands, the distribution of the fire-prone communities, and the presence of many waterways that serve as barriers to fire, it is likely that a single wildfire event will affect a contiguous area no greater than 1,300 acres in Conservation Zones 1, 8, or 11 (i.e., a single fire of no more than 1,300 acres in any of these three zones). The Implementation Office will be required to implement corrective actions for all changed circumstance events that meet this definition.

Planned Response

In the event of a fire in BDCP conservation lands, the Implementation Office will notify the fish and wildlife agencies of the fire event and conduct a preliminary assessment of the likely effects of the fire on covered species and reserve system lands. This information will be used to make an initial determination of whether a changed circumstance has occurred. In most cases, a wildfire will be deemed a natural event that has neutral or beneficial effects on a fire-adapted community. If a changed circumstance is determined to exist, the Implementation Office will implement a series of remedial measures. First, the Implementation Office will conduct a more detailed assessment within three months of the event to identify appropriate post-fire restoration and rehabilitation actions, if any. Such actions, which may include habitat restoration, nonnative invasive species control, or erosion management, will be undertaken to ensure reestablishment of covered plants and other native vegetation through active or passive means, as appropriate. In addition, appropriate erosion control structures and applications (e.g., seeding) will be put in place before the upcoming rainy season.

The Implementation Office will also implement a post-fire monitoring plan for a two-year period following the fire. If over the course of the monitoring period it is determined that vegetation was not recovering sufficiently in the burned area to reestablish the original functions of the affected habitat, the Implementation Office will develop and implement a habitat restoration plan to restore habitat functions of the affected areas.

7.3.2.2.6 Toxic or Hazardous Spills

Nature of Changed Circumstance

Toxic or hazardous spills will be considered a changed circumstance if the spill of chemicals into Delta waters or in a protected or restored natural community could substantially and adversely affect habitat functions for a covered species, as jointly determined by the Implementation Office and the fish and wildlife agencies. In the event that a chemical spill is not caused by a BDCP action, the scope of the remedial actions required will be limited to an area of no greater than 4,000 acres of reserve system lands due to the expected configuration of these lands.

Rationale

A single spill of toxic or hazardous materials could not affect the entire reserve system due to its noncontiguous and dispersed lay out. The parameters defining this changed circumstance reflect the amount of land that will ultimately be protected in the reserve system that may be vulnerable to a spill event. The largest contiguous area of potential reserve system land occurs in Conservation Zone 11. Conservation targets in Zone 11 include Suisun Marsh ROA tidal restoration (7,000 acres), and additional restoration and protection that is assumed to be 9,000 acres, for a total estimated size of the reserve of 16,000 acres. Any toxic or hazardous spill is not expected to affect the entire reserve in this area, so the changed circumstance threshold represents 25% of the BDCP reserve system land base in Conservation Zone 11. The Implementation Office will be required to implement corrective actions for all changed circumstance events that meet this definition.

Planned Responses

For any spill event caused by a BDCP action, the Implementation Office will immediately coordinate its response with DFG's Office for Oil Spill Prevention, the Regional Water Quality Control Board, and

other state and federal regulatory entities as appropriate to the nature of the spill event to curtail the immediate spread of the spill and minimize its effects. As soon as practicable, or as otherwise directed by the aforementioned regulatory entities, the Implementation Office will identify and undertake management measures sufficient to remediate the effects of the toxic substance on covered species and affected habitats (e.g., removal or isolation of the material) and restore the ecological functions of the affected habitat. Onsite habitat restoration or enhancement will be initiated, to the extent practicable, within one year of the spill.

If the affected habitat areas cannot be practicably and effectively restored, the Implementation Office will identify and implement measures to contain the ecological effects of the spill and either compensate for the loss of habitat functions at other locations or implement alternative conservation measures (e.g., expanded or additional contaminant reduction measures) that provide equivalent or greater ecological benefits to the affected covered species. Offsite habitat restoration or enhancement will be initiated, to the extent practicable, within two years of the spill to allow for an appropriate site to be identified and protected, if necessary.

If a spill event has not been caused by a BDCP action, the Implementation Office will coordinate with responsible regulatory agencies and the parties responsible for the spill event. As with a BDCP-caused spill, the Implementation Office will take immediate steps, in conjunction with the relevant regulatory agencies and the responsible parties, to contain the spill and minimize its impact on affected species and habitats. Within three months of spill event, the Implementation Office will complete an assessment of the spill site and provide that assessment to the fish and wildlife agencies for review and concurrence (as per the process identified under Levee Failures). On the basis of this assessment, the Implementation Office will coordinate with responsible regulatory agencies and the parties responsible for the spill event to identity the measures that will need to be funded and/or undertaken by the responsible parties to adequately remediate the effects of the spill and restore the ecological functions of the affected habitat for covered species.

7.3.2.2.7 Nonnative Invasive Species

Nature of Changed Circumstance

A changed circumstance that involves the introduction and proliferation of a new nonnative invasive species will be considered to have occurred if the Implementation Office and the fish and wildlife agencies determine jointly that such a species is present in the Plan Area as a result of BDCP conservation measures, and proliferation of the new nonnative invasive species will be likely to substantially harm or diminish the benefits to covered species provided by BDCP conservation measures.

Rationale

All of the natural communities represented in the Plan Area currently support a large number of nonnative invasive species, including plants, amphibians, fish, and invertebrates. The conservation strategy includes many measures to identify, treat, and, if possible, eradicate nonnative invasive species in the Plan Area in aquatic and terrestrial natural communities. These measures were designed to treat nonnative invasive species currently known in the Plan Area and that have widespread adverse effects on the covered species and natural communities. However, it is foreseeable that new nonnative invasive species will appear in the Plan Area during Plan implementation. If these species were to become widespread, they could cause harmful effects to

covered species or natural communities not contemplated by the effects analysis or the conservation strategy. It is the responsibility of the Implementing Office to address harmful species that are introduced or spread as a result of BDCP conservation measures (e.g., restoration actions that create conditions for colonization of new nonnative invasive species). Nonnative invasive species that are introduced and spread in the Plan Area independent of BDCP conservation measures will be identified and treated as part of the conservation strategy within the limits of the Plan. However, such events are not defined as a changed circumstance and it is not the sole responsibility of Implementing Office to remediate or eradicate those species from the Plan Area. Implementing Office will support efforts to detect, treat, control, and if feasible, eradicate these new nonnative invasive species as part of its conservation strategy and adaptive management and monitoring program.

Planned Response

The Implementation Office will take steps to detect, through the monitoring and adaptive management program and through collaboration with other responsible entities, the establishment and spread of new invasive species in the Plan Area. If a new invasive species is discovered, the Implementation Office will conduct an assessment to determine the possible threats of the invasive species to covered species and BDCP protected and/or restored habitat. Remedial responses will be informed by the results of the assessment and will be implemented through the adaptive management and monitoring program.

Based on results of the assessment, the Implementation Office would, through the adaptive management and monitoring program, identify and implement, to the extent reasonable and practicable, measures to reduce and/or control the adverse effects of new nonnative species on the functions provided by the conservation measures under the Plan. If methods to adequately reduce and/or control adverse effects of the nonnative species on the functions of restored physical habitats are not available or practicable, the Implementation Office will identify practicable alternative design, implementation, and management approaches to future habitat restoration actions within the parameters of the adaptive management and monitoring program to avoid or minimize potential adverse effects of the invasive species on covered species. If methods are not available to reduce and/or control adverse effects of invasive species on water operations, physical habitat, and other conservation measures, the Implementation Office, within defined adaptive ranges, will identify and implement alternative conservation measures that provide equivalent or greater benefits to covered species and their habitats to the extent reasonable and practicable. The effectiveness of remedial measures will be monitored over time and, based on their efficacy, such measures may be adjusted within the framework of the adaptive management and monitoring program.

7.3.2.2.8 Climate Change

Nature of Changed Circumstance

Long-term changes in sea level, watershed hydrology, precipitation, temperature (air or water), or ocean conditions that are of the magnitude or effect assumed for the BDCP effects analysis and that adversely affect conservation strategy implementation or covered species are considered a changed circumstance. The occurrence of this changed circumstance will be determined jointly by the Implementation Office and fish and wildlife agencies.

Rationale

The expected effects of climate change are discussed in detail in Chapter 2, Section 2.3.2.6, *Effects of Anthropogenic Influence and Future Climate Change*. The assumptions for climate change used in the effects analysis are described in Chapter 5, *Effects Analysis* and Appendix A, *Conceptual Foundation and Analytical Framework*. These assumptions are considered a reasonable worst-case scenario. The Implementation Office will be required to implement corrective actions for all changed circumstance events that meet this definition.

Planned Response

The conservation strategy, monitoring and research program, and adaptive management and monitoring program already include conservation measures, monitoring, and responses to anticipate climate change effects at the landscape, natural community, and species scales. For example, biological goals and objectives have been established at the landscape level to take climate change into account during conservation strategy implementation (Goal ECSY7, Objective 7.1). Habitat restoration and protection will take into account natural community and species ecological responses to climate change, such as changes in range, abundance, distribution, and habitat suitability (CM 3 and CM 4). Construction and preferential operation of a new water diversion facility in the north Delta is proposed in part because of climate change considerations. System-wide monitoring actions have been established to detect and allow for adaptive management responses (Element 4: Climate Change, Monitoring Action SY4-1; Element 6: Landscape Change, Monitoring Action SY6-1).

The adaptive management and monitoring program (Chapter 3, Section 3.5, *Adaptive Management and Monitoring Program*) monitors climate change effects and assumes that conservation measures will need to be adjusted in response to these effects. This will allow the Implementation Office to continually adjust conservation measures to the changing conditions in the Plan Area. Remedial measures, if needed, will be applied to ensure desirable ecosystem function and persistence of natural communities and covered species.

The Implementation Office may identify and adjust implementation of the conservation measures to moderate the ecological effects of climate change. Such adaptive management responses may include identifying alternative locations for implementing habitat restoration or protection actions in the Plan Area to increase habitat availability and suitability and to allow movement across environmental gradients. Examples include creation of cool water refugia, expansion of the range of environmental gradients included in restoration design, or selection of protected sites to provide for shifting species distributions and habitats. Measures beyond those contemplated by the adaptive management and monitoring program for conservation measures are not likely to be necessary because a reasonable worst-case scenario was evaluated. A change in conservation measures beyond that considered or feasible through the adaptive management and monitoring program will be considered an unforeseen circumstance.

7.3.3 Unforeseen Circumstances

The USFWS and NMFS define *unforeseen circumstances* as those changes in circumstances that affect a species or geographic area covered by an HCP that could not reasonably have been anticipated by the plan participants during the development of the conservation plan, and that result in a substantial and adverse change in the status of a covered species (50 CFR 17.3, 50 CFR 222.102).

Under ESA regulations, if unforeseen circumstances arise during the life of the BDCP, USFWS and/or NMFS may not require the commitment of additional land or financial compensation, or additional restrictions on the use of land, water, or other natural resources other than those agreed to in the plan, unless the Proposed Authorized Entities consent.

Within these constraints, USFWS and/or NMFS may require additional measures, but only if the following conditions apply.

- The agencies prove an unforeseen circumstance exists.
- Such measures are limited to modifications of the BDCP's operating conservation program for the affected species.
- The original terms of the plan are maintained to the maximum extent practicable.
- The overall cost of implementing the BDCP is not increased by the modification.

USFWS and/or NMFS bear the burden of demonstrating that unforeseen circumstances exist. A finding of unforeseen circumstances must be clearly documented, based on the best available scientific and commercial information, and made considering certain specific factors.[8] If such a finding is made and additional measures are required, the BDCP Proposed Authorized Entities will work with USFWS and/or NMFS to appropriately redirect resources to address the unforeseen circumstances.

Similarly, *unforeseen circumstances* are defined in the NCCPA as changes affecting one or more species, habitat, natural community, or the geographic area covered by a conservation plan that could not reasonably have been anticipated at the time of plan development, and that result in a substantial adverse change in the status of one or more covered species (California Fish and Game Code 2805(k)). The NCCPA further provides that, in the event of unforeseen circumstances, DFG shall not require additional land, water, or financial compensation or additional restrictions on the use of land, water, or other natural resources without the consent of the plan participants for a period of time specified in the Implementation Agreement. However, such assurances are not applicable in those circumstances in which DFG determines that the plan is not being implemented consistent with the substantive terms of the Implementation Agreement (California Fish and Game Code 2820(f)(2)).

7.3.4 Applicability of Other Federal Endangered Species Act Issues to the BDCP

7.3.4.1 Future Recovery Plans

Recovery plans under the ESA delineate actions necessary to recover and protect federally listed species. These plans provide useful information and recommendations to guide conservation

[8] These factors include the following: (1) size of the current range of the affected species; (2) percentage of range adversely affected by the conservation plan; (3) percentage of range conserved by the conservation plan; (4) ecological significance of that portion of the range affected by the conservation plan; (5) level of knowledge about the affected species and the degree of specificity of the species' conservation program under the conservation plan; and (6) whether failure to adopt additional conservation measures would appreciably reduce the likelihood of survival and recovery of the affected species in the wild. 50 CFR 17.22(b)(5)(iii)(C); 50 CFR 222.307(g)(3)(iii).

measures that are intended to help recover species. However, recovery plans are not intended to establish obligations of permittees to undertake specific tasks.

The plan participants, USFWS, and NMFS acknowledge that ESA recovery plans will have no effect on the implementation of the BDCP, except to the extent that they may contribute information to the Adaptive Management and Monitoring Program. Any recovery plan applicable to any covered species in the Plan Area that is developed after the approval of the BDCP will:

- Not require any additional water, land, or financial compensation be provided by the Proposed Authorized Entities.
- Be finalized only after the USFWS or NMFS has conferred with and requested input from the Implementation Office on the preparation of the recovery plan.
- In no way diminish or otherwise alter the take authorizations provided pursuant to the BDCP, the Implementing Agreement, and the companion BA.

7.3.4.2 Future Section 7 Consultations

An important goal of the BDCP is to provide ESA compliance for the conservation measures and other covered activities regardless of whether those measures or activities obtain their federal take authorization through Section 7 or 10 of the ESA. Many conservation measures or other covered activities will require a future Section 7 consultation because the action will be undertaken by a federal agency, will receive federal funding, or will require a federal permit. Section 7 consultations apply only to federally listed species, so only those covered species that are federally listed at the time of the consultation need be included in the consultation.

In any consultation under Section 7 that occurs for BDCP covered activities after the approval of the BDCP, USFWS and NMFS will ensure that these biological opinions (BOs) are consistent with the BDCP BOs, the plan, and the federal permit. The covered activity subject to Section 7 must be consistent with the terms and conditions of the BDCP and the Implementing Agreement. Any reasonable and prudent measures included under the terms and conditions of a BO issued subsequent to the approval of the BDCP with regard to the covered species and covered activities will, to the maximum extent appropriate, be consistent with the BDCP and the Implementing Agreement. Neither USFWS nor NMFS will impose measures in excess of those that have been or will be required by the Proposed Authorized Entities pursuant to the BDCP, the Implementing Agreement, or the companion BA.

7.4 Permit Duration and Renewal, Plan Changes, Permit Suspension and Revocation

This section describes the process for a permit extension, the process for informal or formal changes to the plan, and the unlikely chance of a permit suspension or revocation. The plan can be modified during implementation in accordance with DFG, USFWS, and NMFS regulations and the terms of the permits and Implementing Agreement. Plan modifications may be needed periodically to clarify provisions or correct unanticipated inconsistencies in the documents. Plan changes fall into three broad categories. In order of importance, they are administrative changes, minor modifications, and formal amendments. Each is discussed below.

7.4.1 Permit Duration and Extension

The Proposed Authorized Entities are seeking take authorizations from the state and federal fish and wildlife agencies with terms of 50 years. The terms of the take authorizations issued under the BDCP would begin from the date of their issuance. Prior to expiration of the take permits, the Proposed Authorized Entities may apply to the fish and wildlife agencies to renew them. The Proposed Authorized Entities will initiate the permit renewal process prior to the expiration of the initial 50-year period and with ample time to allow for the review and processing of the permit renewal.

7.4.2 BDCP Administrative Changes

The administration and implementation of the BDCP will require frequent and ongoing interpretation of the provisions of the plan. Actions taken on the basis of these interpretations that do not substantively change the purpose or intent of the plan provisions will not require modification or amendment of the BDCP or its associated authorizations. Such actions related to the ordinary administration and implementation of the BDCP may include, but are not limited to, those following.

- Clerical corrections to typographical, grammatical, and similar editing errors that do not change the intended meaning; or to maps or other exhibits to address insignificant errors.
- Adaptive management changes to conservation measures, including actions to avoid, minimize, and mitigate impacts, or modifications to habitat management strategies developed through and consistent with the adaptive management and monitoring program described in Chapter 3.
- Variations in the day-to-day management of reserve system lands, such as adjusting irrigation schedules for created or restored habitat on the basis of observed water needs of planted vegetation.
- Adaptations to the design of directed studies.
- Adjustments to monitoring protocols to incorporate new protocols approved by the fish and wildlife agencies.
- Administration of the Implementation Office.
- Changes in the membership of BDCP advisory committees.

7.4.3 Minor Modifications or Revisions

As part of the process of plan implementation, the Implementation Office likely will need to make minor changes (minor modifications or revisions) to the BDCP from time to time to respond appropriately to new information, scientific understanding, technological advances, and other such circumstances. Minor modifications or revisions in many instances will be technical in nature and will not involve changes that would adversely affect covered species, the level of take, or the obligations of Proposed Authorized Entities. The process for implementing minor modifications or revisions is set forth in Section 6.4.3.1 below.

Minor modifications or revisions may include, but are not limited to, the following circumstances.

- Minor corrections to land ownership descriptions.

- Changes to survey, monitoring, reporting and/or management protocols that do not adversely affect covered species or habitat functions and values.
- Transfers of targeted acreages between ROAs consistent with criteria set out in Chapter 3, *Conservation Strategy*.
- Transfers of targeted habitat acreages among BDCP conservation zones, provided such change does not preclude meeting preserve assembly requirements, significantly increase the cost of the BDCP management, or preclude achieving covered species and natural community goals and objectives.
- Extensions of earth moving or ground disturbance outside the right-of-way limits analyzed in the BDCP for covered activities involving infrastructure development or habitat restoration.
- Updates or corrections to the vegetation or other resource maps or species occurrence data.
- Other proposed changes to the plan that the permitting agencies have determined to be unsubstantial and appropriate for implementation as a minor amendment.

7.4.3.1 Procedures for Minor Modifications or Revisions

The Implementation Office, the Proposed Authorized Entities, or the fish and wildlife agencies may propose minor modifications or revisions by providing written notice to the Implementation Office, Proposed Authorized Entities, and fish and wildlife agencies. Such notice will include a description of the proposed minor modifications or revisions, an explanation of the reason for the proposed minor modifications or revisions, an analysis of its environmental effects including any impacts on covered species, and an explanation of why the effects of the proposed minor modifications or revisions would not:

- significantly differ from, and would be biologically equivalent to, the effects described in the BDCP, as originally adopted, or
- conflict with the terms and conditions of the BDCP, as originally adopted, or
- significantly impair implementation of the BDCP conservation strategy.

The fish and wildlife agencies and/or the Proposed Authorized Entities may submit comments on the proposed minor modification or revision in writing within 60 days of receipt of notice. If any Proposed Authorized Entity disagrees with the proposed minor modification or revision for any reason, the minor modification or revision will not be incorporated into the BDCP. If the fish and wildlife agencies do not concur that the proposed minor modification or revision meets the requirements for a minor modification or revision, the proposal must be approved according to the amendment process. Any Proposed Authorized Entity or fish and wildlife agency may institute the informal meet and confer process set forth in the BDCP Implementing Agreement to resolve disagreements concerning a proposed minor modifications or revisions.

If the Proposed Authorized Entities are in agreement regarding the proposed minor modification or revision, and the fish and wildlife agencies concur that the requirements for a minor modification or revision have been met and the modification or revision should be incorporated into the plan, the BDCP will be modified accordingly. If any fish and wildlife agency fails to respond to the written notice within the 60-day period, the agency will be deemed to have approved the proposed minor modification or revision.

7.4.4 Formal Amendment

Under some circumstances, it may be necessary to substantially amend the BDCP. Any proposed changes to the BDCP that do not qualify for treatment under Sections 6.4.2 or 6.4.3 will require formal amendment. Formal amendment to the BDCP also will require corresponding amendment to the authorizations/permits, in accordance with applicable laws and regulations regarding permit amendments. The BDCP Implementation Office will be responsible for submitting any proposed amendments to the fish and wildlife agencies.

Amendments to the BDCP likely will occur infrequently. The process for making formal amendments is set forth in Section 6.4.4.1. Formal amendments include, but are not limited to, those following.

- Substantive changes to the boundary of the Plan Area, other than those associated with the acquisition of terrestrial habitat in the surrounding Delta counties, as described in Section 1.4.1, *Geographic Scope of the Plan Area*.
- Additions of species to the covered species list.
- Increasing the allowable take limits of covered activities or adding new covered activities to the plan.
- Substantial changes in implementation schedules that would have significant adverse effects on the covered species.
- Changes in water operations conservation measures or covered water operations that are outside the ranges established in the plan for water operations.

7.4.4.1 Process for Formal Amendment

Formal amendments will involve the same process that was required for the original approval of the BDCP. In most cases, an amendment will require public review and comment, CEQA/NEPA compliance, and intra-Service Section 7 consultation. Amendments will be subject to review and approval by the Implementation Office and the Proposed Authorized Entities. The fish and wildlife agencies will use reasonable efforts to process proposed amendments within 180 days.

7.4.5 Suspension of the Federal Permits

Under certain circumstances defined by federal regulation, USFWS or NMFS may suspend, in whole or in part, the regulatory authorizations they issue under the BDCP. However, except where USFWS or NMFS determines that emergency action is necessary to avoid irreparable harm to a covered species, it will not suspend an authorization without first attempting to resolve the issue through the informal dispute resolution process set forth in the BDCP Implementing Agreement, and identifying the facts or action/inaction that may warrant the suspension and providing the Implementation Office a reasonable opportunity to implement appropriate responsive actions. Any decision to suspend one or both federal permits must be in writing and must be signed by the Secretary of the Interior or the Secretary of Commerce, as the case may be.

7.4.5.1 Reinstatement of Suspended Federal Permit

If USFWS or NMFS suspends a federal permit, as soon as possible but no later than 10 days after the suspension, it will meet and confer with the Implementation Office and Proposed Authorized

Entities to discuss how the permits can be reinstated. At the conclusion of the meeting, USFWS and/or NMFS will identify reasonable, specific actions needed to address the suspension. Upon performance or completion of the actions, USFWS and/or NMFS will immediately reinstate the federal permit. It is the expectation of the BDCP participants that the federal fish and wildlife agencies and the permit holders will strive to reinstate the federal permit as soon as possible.

7.4.6 Revocation of the Federal Permits

The No Surprises rule, as promulgated in 1998, did not address circumstances in which a species covered by a permitted HCP experienced significant decline and the continuation of an activity covered by the HCP would contribute to the likelihood of jeopardy to the species. To address such circumstances, USFWS issued a regulation in 2004, known as the Permit Revocation rule, that allows USFWS to nullify regulatory assurances granted under the No Surprises rule and revoke the Section 10 permit only in specified instances, including where continuation of a permitted activity would jeopardize the continued existence of a species covered by an HCP and the impact of the permitted activity on the species has not been remedied in a timely manner (69 FR 7172, December 10,2004).

In the event that such unforeseen circumstances were to arise under the BDCP, USFWS and/or NMFS would work with the BDCP Implementation Office and the Proposed Authorized Entities to avoid a permit revocation. The federal fish and wildlife agencies would engage in the following process prior to taking any steps to revoke the BDCP permits.

- The BDCP Implementation Office and the fish and wildlife agencies would determine, through the adaptive management process, whether changes can be made to the BDCP's operating conservation program to remedy the situation.
- The USFWS or NMFS would determine whether the fish and wildlife agencies or other state and federal agencies can undertake actions that would remedy the situation. It is recognized that the fish and wildlife agencies have available a wide array of authorities and resources that can be used to provide additional protection for the species, as do other state and federal agencies.
- The Implementation Office and the fish and wildlife agencies will determine whether there are additional voluntary conservation actions that the Implementation Office could undertake to remedy the situation.

The USFWS or NMFS would begin the revocation process only if it is determined that the continuation of a BDCP covered activity would appreciably reduce the likelihood of survival and recovery of one or more covered species and that no remedy can be found and implemented. The USFWS or NMFS also could begin the revocation process if the Proposed Authorized Entities fail to fulfill their obligations under the BDCP, and only after completing the informal dispute resolution process described in the BDCP Implementing Agreement, and identifying the actions or inactions that may warrant the revocation and giving the Implementation Office a reasonable opportunity to implement appropriate responsive actions. The USFWS or NMFS would follow the administrative procedures set out in the BDCP Implementing Agreement and the regulations implementing the Permit Revocation rule (50 CFR 13.28 and 13.29). Any decision to revoke one or both federal permits must be in writing and must be signed by the Secretary of the Interior or the Secretary of Commerce, as the case may warrant.

7.4.7 Suspension or Revocation of the State Permit

The NCCPA requires that the implementation agreement include specific terms and conditions that, if violated, result in suspension or revocation of the Section 2835 take permit. Such terms and conditions must include suspension or revocation of the permit if the plan participants fail to provide adequate funding to implement the plan; do not maintain proportionality between impacts on habitats or covered species and conservation measures; adopt or approve changes to the plan that are not consistent with the objectives and requirements of the approved plan without concurrence of the wildlife agencies; or allow the level of take to exceed the permit limits (California Fish and Game Code 2820(b)(3)). DFG also must suspend or revoke a Section 2835 take permit if continued take would result in jeopardy to a species (California Fish and Game Code 2820(c)).

If the Proposed Authorized Entities violate the terms and conditions of the state permits, or if necessary to avoid jeopardizing the continued existence of a listed species, DFG may suspend or revoke the permits in whole or in part. However, unless immediate revocation is necessary to avoid the likelihood of jeopardy to a listed species or to address rough proportionality (see below), DFG will not suspend or revoke the state permits without first attempting to resolve any disagreements regarding the implementation or interpretation of the BDCP or this agreement in accordance with the informal dispute resolution process provided in the BDCP Implementing Agreement, and notifying the Implementation Office and Proposed Authorized Entities of the action or inaction that may warrant the suspension or revocation and providing the Implementation Office and Proposed Authorized Entities with a reasonable opportunity to take appropriate responsive action. Any decision to suspend or revoke one or both state permits must be in writing and must be signed by the Director of DFG.

7.4.7.1 Failure to Maintain Rough Proportionality

The NCCPA requires revocation of a Section 2835 take permit, in whole or in part, if the plan participants do not maintain rough proportionality between impacts on habitats or covered species and conservation measures and do not, within 45 days, remedy such condition or develop a plan with DFG to provide a remedy(California Fish and Game Code 2820(c)).

Rough proportionality will be maintained by implementing the conservation measures substantially in accordance with the agreed-upon plan implementation schedule. If DFG determines, after conferring with USFWS, NMFS, and the Implementation Office, that rough proportionality is not being maintained, the Implementation Office, Proposed Authorized Entities, and DFG will meet and confer and, within 45 days of DFG's determination, agree on adjustments to the implementation schedule to expeditiously regain rough proportionality. Adjustments to the implementation schedule may include any of a variety of commitments or adjustments to BDCP implementation designed to regain rough proportionality, including advancing or accelerating plans to acquire, restore, or enhance lands of the appropriate land-cover type. The Implementation Office will implement all actions set forth in the agreed-upon adjusted implementation schedule. As an alternative to the agreement, the Implementation Office may regain rough proportionality within 45 days by implementing the actions according to the existing implementation schedule.

7.4.7.2 State Permit Suspension and Revocation Steps

In the event that such circumstances for permit revocation or suspension were to arise under the BDCP, DFG would work with the BDCP Implementation Office and the Proposed Authorized Entities

to obviate the need for permit revocation or suspension. The DFG would engage in the following process prior to taking any steps to revoke the BDCP permits.

- In the event of a failure to maintain rough proportionality, the BDCP Implementation Office will work with DFG to remedy the situation through schedule adjustments as described in Section 6.4.6.1 and in accordance with the Implementation Agreement. Note that the BDCP monitoring program is designed to identify such issues and that the Implementation Office must report such issues in annual reports.
- For other situations that could result in permit revocation or suspension or if rough proportionality cannot be regained through schedule adjustments, the BDCP Implementation Office, Proposed Authorized Entities, and DFG would determine, through the adaptive management process, whether other changes can be made to the BDCP's operating conservation program to remedy the situation.
- DFG will determine whether DFG or the federal fish and wildlife agencies or other state and federal agencies can undertake actions that would remedy the situation. It is recognized that the fish and wildlife agencies have available a wide array of authorities and resources that can be used to provide additional protection for the species, as do other state and federal agencies.
- The Implementation Office and DFG will determine whether there are additional voluntary conservation actions that the Implementation Office could undertake to remedy the situation.

DFG would begin the revocation or suspension process only if no solutions are found and it is determined that the continuation of a BDCP covered activity would result in jeopardy to a species or violate any of the terms and conditions for permit revocation or suspension identified in the Implementing Agreement.

7.5 References

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